ENVIRONMENTAL PRODUCT DECLARATION

according to the standards EN ISO 14025:2010
and EN 15804+A1:2013

Organization	**Liberty Ostrava a.s.**
Programme holder	CENIA, Czech Environmental Information Agency, executive function of the Agency NPEZ
The document was processed by	Technical and Test Institute for Construction Prague, SOE
Declaration number	7220002
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Welded pipes (SAWH)

1. General Information

Liberty Ostrava a.s.	**Welded pipes (SAWH)**
Program: „National Environmental Labeling Program“ - CZ **Programme holder:** CENIA, Czech Environmental Information Agency, executive function of the Agency NPEZ, Moskevská 1523/63, Praha 10, 101 00, www.cenia.cz ,	**Name and address of manufacturer:** **Liberty Ostrava a.s.,** Vratimovská 689/1174 719 00 Ostrava - Kunčice
Declaration number: 7220002	**Declaration unit:** **1 t „ Welded pipes (SAWH) “**
Product Category Rules: EN 15804+A1:2013	**Product:** **Welded pipes (SAWH)**

Liberty Ostrava a. s. – in form of such Environmental Declaration of the Product Type III (EPD) – hereby states and defines its attitude towards the environmental protection, whereas the Company hereby documents the fact that it disposes of relevant data on impacts on the environment caused by the production of Company Products.

Liberty Ostrava a. s. is integral part of LIBERTY Steel, a global Steel and Logging Company counting about 30,000 Employees in more than 200 areas on six continents. The Company makes more than 2 million tons of steel per a year, whereas such steel is used particularly in building industries and engineering. The Company is the biggest Producer of road crash barriers and tubes in the Czech Republic. Besides the Czech market, the Company supplies its Products to more than 40 countries all over the world.

Said EPD provides quantified environmental information on a construction product on a harmonized and scientific-based principle. Accordingly, such EPD shall also provide general information on the Product within the assessment of a life cycle of a building and other construction buildings; and it also shall help to identify Products less burdening the environment.

With regard to the possibility to compare the Products **within the assessment of a life cycle of construction buildings** based on their EPD – done by the specification of their contribution to the environmental properties of a construction building – EPD of specified construction products shall be compiled in duly compliance with the requirements specified and defined by EN 15804+A1:2013 *Sustainability of Construction Buildings – Environmental Statement of the Product – Principals For Product Category of Construction Products*.

1.1. Data On The Product

1.1.1. Product

Welded Pipes (HSAW)

Plant 15 – Tube Plant is the biggest Producer of pipes and tubes in the Czech Republic. Seamless pipes and welded ones are core production program of Plant 15. Spiral-welded pipes produced by Production Shop No. 153 – Welding Plant – are produced from hot-rolled coils. Welded pipes for flammable media transport shall be deemed the most sophisticated Product. Since 1957, Pant 15 has been authorized to stamp its welded pipes by API – initials of the U.S. Petroleum Institute.

Producer´s web sites show the actual catalogues of supplied types of said Products.

The quality of the Products is based on the effective Quality Management System under EN ISO 9001 and in compliance with technical regulations related to the type of the Product.

The Company shows the certified integrated Quality Management System under EN ISO 9001, the Environment Management System under EN ISO 14001, the Health and Safety Management

System under ČSN ISO 450001 and the Power Management System under EN ISO 50001 issued by TÜV NORD Czech, s.r.o.

Plant 15 – **Tube Plant** – is also the Holder of the Certificates issued by reputable Certification Companies Lloyd's Register EMEA (1988), Bureau Veritas (1992) and DNV-GL (1996) etc. Seamless pipes and spiral-welded pipes for pressure technology (facilities) were certified under PED 2014/68/EU by TÜV NORD in 2001.

Technical data on the Product are declared by the Producer in respective catalogues of Product series.

1.1.2. Technical Data On The Product

Respective information on construction data and mechanical and chemical properties of the Product are provided in related technical literature and/or in Standards listed below: -

- ČSN 42 0144 "Spiral welded steel"
- DIN 1615 "Welded circular tubes of non-alloy steels without special quality requirements"

- DIN 1626 “Welded circular tubes of non-alloy steels with special quality requirements”
- EN 10208-1 “Steel tubes for pipeline for combustible liquids” – part 1: Requirements according to class A
- EN 10208-2 “Steel tubes for pipeline for combustible liquids” – part 2: Requirements according to class B
- EN 10217-1 “Welded steel pipes for pressure purposes”
- EN 10217-3 “Welded steel pipes for pressure vessel”
- EN 10217-5 “Welded steel tubes for pressure purposes. Submerged arc welded non-alloy and alloy steel tubes with specified elevated temperature properties”
- EN 10219-1 “Cold formed welded structural hollow sections of non-alloy and fine grain steels”
- EN 10224 “Non-alloy steel tubes and fittings for the conveyance of water and other aqueous liquids”
- API Spec 5L “Specification for Line Pipe”
- ISO 3183 “Steel pipe for pipeline transportation systems”
- PN 79/H-74244 “Welded steel pipes for transportation of media”

Products are regularly assessed under the effective regulations referred/applied them. Declaration of Properties, the Compliance Certificate and the National Declarations are available on web sites of the Producer: -

(https://libertysteelgroup.com/cz/products/certifikaty-liberty-tubular-products-ostrava-a-s/).

Technical data on the Product are declared by the Producer in respective catalogues of Product series.

1.1.3. Rules For Product Use

Products are produced under the Standards listed in 1.1.2 therein. Products shall be subject to the obligatory certification, whereas the Producer shall issue respective Compliance Certificate.

Environment & Health Protection During Product Using

Under the usual conditions, pipes/tubes do not create any negative impacts on human health and they even do not release any volatile substances to the atmosphere.

With regard to extremely low metal release from steel and thanks to low requirements for Products maintenance, no impacts on the environment, water, air or soil can be expected.

Reference Service Life

Reference service life for welded pipes is not declared at all. We are speaking about Products showing many various application purposes. Service life is limited by service life of respective construction and technological units.

1.1.4. Methods Of Supply

Products are supplied under the Standards listed in 1.1.2 therein.

Products quality is protected by the effective Quality Management System under EN ISO 9001 and in compliance with technical regulations related to the Product series.

The Company shows the certified integrated Quality Management System under EN ISO 9001, the Environment Management System under EN ISO 14001, the Health and Safety Management System under ČSN ISO 450001 issued by the Certification Company BUREAU VERITAS and the Power Management System under EN ISO 50001 issued by TÜV NORD Czech, s.r.o.

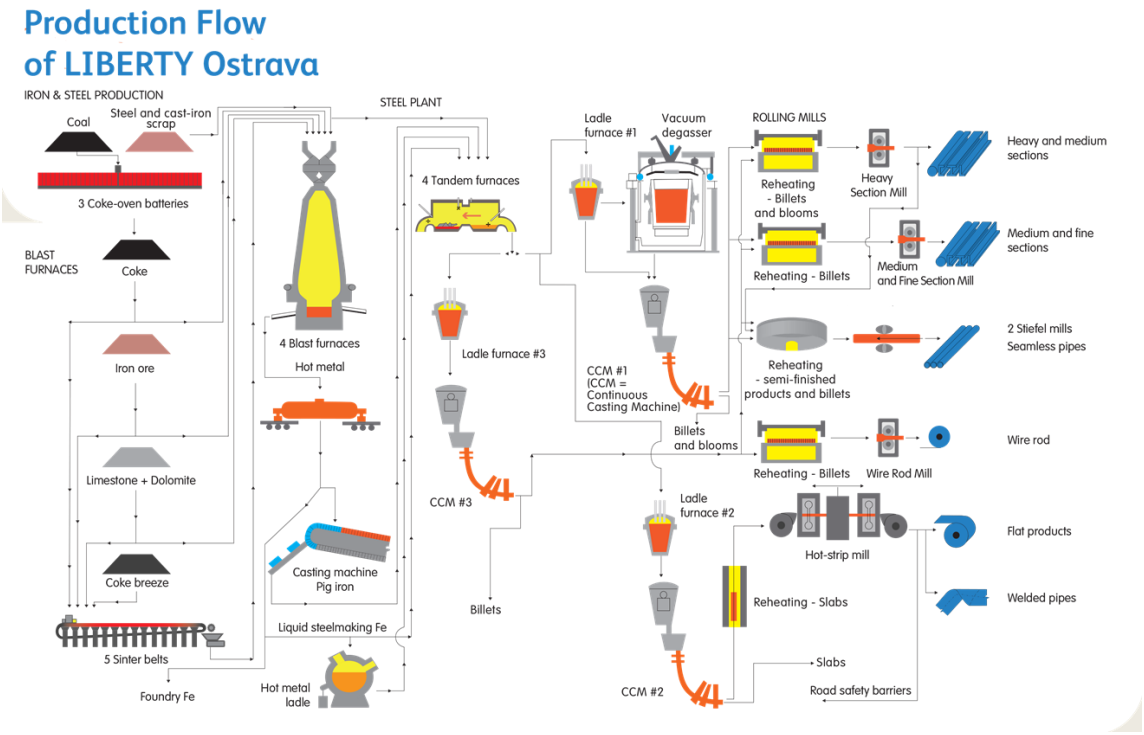
1.1.5. Base Materials & Adjuvants

Iron is base material of steel pipes. Alloying elements are added in form of ferroalloys or metals (manganese, chrome and vanadium are the most common elements). Other elements may be present in steel, e.g. nitrogen or copper – in dependence on steel designation / steel quality. Substances listed on the list of substances evoking extraordinary qualms being subject to permit by the European Chemicals Agency are not contained in steel in declared quantities.

1.1.3. Production

Pipes production is closely linked to the production by Production Shops at Plant 10 (Coke-oven Plant), Plant 12 (Blast Furnaces) and plant 13 (Steel Plant) that have been balanced separately. Resultant data are used for the definition of processes entering sequential Production Shops at Plant 16 (Rolling Mills) and Tube Plant – Plant 15BŠ and Plant 15SV.

Fig. 1: Production Process Flow Diagram



1.1.4. Waste Management

Under the actual conditions of knowledge, no expected environmental losses or damages occur during steel welded pipes dismantling and recycling.

Thanks to its ability to renew original properties without any quality loss after melting, steel shall be deemed the most recycled material in the world.

At the end of their service life, 99 % of steel welded pipes can be recycled, whereas some of them can be used for a less sophisticated use.

Contingent steel waste is categorized to the group 17.04.05 „Iron & Steel“.

1.2. LCA: Calculation rules

1.2.1. Declaration unit

Declaration unit is **1 t of manufactured products - „ Welded pipes (SAWH)**“.

2. Product system and system boundaries

The boundary of the product life cycle study system is only the information module **A1 - A3 "Production phase"** in accordance with standard EN 15804 + A1: 2013. The created EPD covers the information modules A1-A3, which means from the cradle to the gate. Other modules A4 to C4 and module D, which is intended to provide additional information beyond the life cycle, have not been included in the LCA due to the difficult availability of input data and are not declared for this EPD. The reference service life of the elements is also not declared depending on the unavailability of representative data on operating conditions in the product use stage.

Information on product system boundaries is shown in Table 1.

The boundaries of the system are set to include both those processes that provide material and energy inputs to the system, and subsequent production and transportation processes up to the production gateway, and the processing of all waste resulting from these processes.

The production stage includes these modules:

- **A1**, raw material extraction and processing, processing of secondary material input
- **A2**, transport of raw materials from supplier to manufacturer, in-house transport
- **A3**, manufacturing

including the supply of all materials, products and energy, the treatment of waste until it reaches a state where it ceases to be waste or after the removal of the last material residues during the production stage.

The potential benefits and costs from the production stage do not exceed the selected systém boundaries of the A1-A3 system.

Table 1

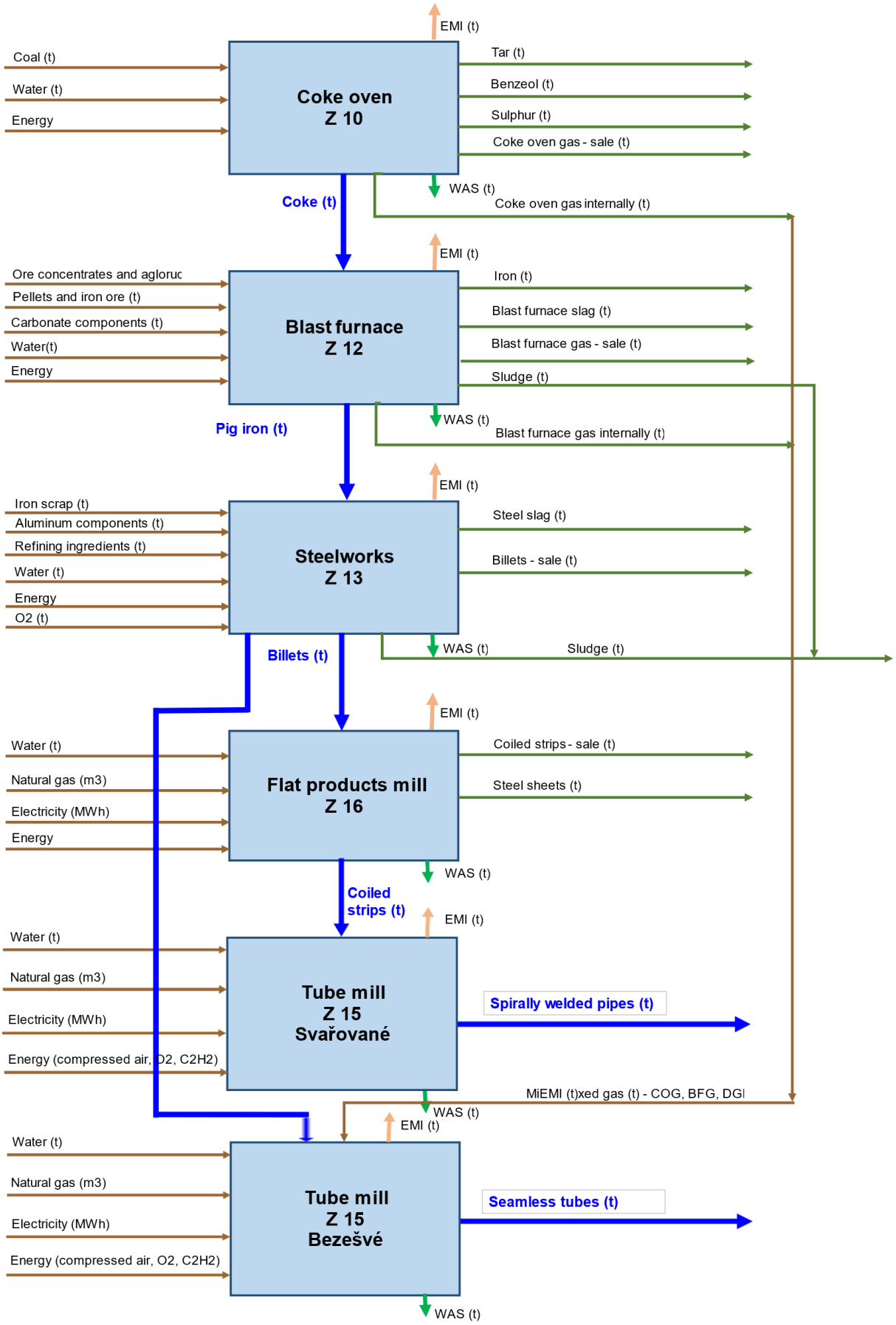
Information about product system boundaries – information modules (**X** = included, **MND** = the module is not declared)																
Product stage			**Construction process stage**		**Use stage**							**End of life stage**				**Supplementary information beyond the building life cycle**
Raw material supply	Transport	manufacturing	Transpost	Construction-installation proces	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-, Recovery-, Recyclingpotential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	**X**	**X**	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

The boundaries of the product system are considered to include only production processes, **not administrative activities**.

The production of these products is carried out by these named sub-plants Liberty Ostrava a.s.:

- manufacturing plant 10 – Coke oven,
- manufacturing plant 12 – Blast furnaces,
- manufacturing plant 13 – Steelworks,
- manufacturing plant 16 – Flat products mill
- manufacturing plant 15 – Tube mill.

The processes of these sub-plants are included in the product system boundaries according to the following diagrams:



EMI = Emission
WAS=Waste

Information modules **A4 to C4 and module D**, which is intended to provide additional information beyond the life cycle, have **not been included** in the LCA due to the difficult availability of input

data and are therefore not declared. The reference service life of the products is also not declared depending on the unavailability of representative data on operating conditions in the product use phase.

2.1. Assumptions and measures taken

The analysis did not include the processes required for the installation of production equipment and the construction of infrastructure. Administrative processes are also not included - inputs and outputs are balanced on the production stage.

The time range of the required specific data provided by Liberty Ostrava a.s. for the processing of this report was set as a representative time period of the calendar **year 2019**. This is also due to the link to the data included in the previous process balances in plants Z10, Z12 and Z13. For this period, the organization was provided with all available data for their further processing.

2.2. Exclusion rules

All operational data concerning product recipes, energy data, diesel consumption and distribution of annual waste production and emissions according to the records of plants Z16 and Z15 were taken for the study. For all considered inputs and outputs, transport costs were considered or differences in transport distances were recognized.

In terms of produced waste, only those wastes that are clearly related to production activities were included in the analysis.

For some input data, due to their complexity of obtaining, alternative methods were chosen in the form of a qualified calculation based on available information. Some input data were converted to units that were needed for the selected generic process data in the environmental impact assessment calculation program.

2.3. Sources of environmental data

The necessary specific data concerning the production stage were determined on the basis of the consumed amount of input materials and outputs - production of finished products from the relevant sources of required data. Consumption of quantities of basic raw materials and other inputs was reported on the basis of data from the information system.

All inputs and outputs were entered in system units, namely:

- Material and auxiliary inputs and product outputs in kg
- Sources used as energy input (primary energy) were expressed in kWh or MJ, including renewable energy sources (hydropower, wind energy)
- Water consumption was expressed in m^3 (cubic meters);
- Inputs related to transport were expressed in km (distance), tkm (material transfer) and in kg (diesel consumption, etc.)
- Time was expressed in practical units depending on the scale of assessment: minutes, hours, days, years.

The source of input data was operational data obtained from the organization registered in the SAP information system, as well as outputs from monitoring and measuring waste production and emissions.

They were used for a complete analysis of environmental parameters:

- SimaPro computer software, version 9.2 SimaPro Analyst (Ecoinvent database version 3.7)

2.4. Data quality

The data used to calculate the EPD correspond to the following principles:

Time period: Manufacturer's data for **2019** are used for specific data (the requirement to use average data for a period of 1 year is met). Data from the Ecoinvent database version 3.7 are used for generic data

Technological aspect: Data corresponding to the current production of individual product types of all plants and corresponding to the current state of the technologies used in individual sub-plants Z10, Z12, Z13 (data taken over) and Z16 and Z15 (new data) are used.

Completeness aspect: Most of the input data is based on consumption balances, which are accurately recorded in the information system. As part of the completeness check, Liberty Ostrava a.s. and it was checked whether all used inputs / outputs appear in the records (except for the excluded input data listed in Chapter 2. The reliability of the source of specific data is given by the uniformity of the information system collection methodology.

Geographical aspect: The generic data used from the Ecoinvent database are used valid for the Czech Republic (eg energy inputs) and if data for the Czech Republic are not available, data valid for the EU or according to the supplier's location are used.

Consistency aspect: Uniform aspects are used throughout the report (allocation rules, data age, technological scope, time scope, geographical scope).

Credibility aspect: All important data were checked for cross-comparison of mass balances.

2.5. Assessment period

The data provided by the partial production units of Liberty Ostrava a.s. for the period **2019**.

2.6. Allocation

As part of the report, the allocation of inputs and output products was made. A uniform method based on weight fractions was used for allocation. The data converted into the declared unit of **1t of produced intermediate products** (for production sections Z10, Z12, Z13 and Z16) and **1t of produced final products** - seamless pipes (Z15BŠ) were considered for inventory and evaluation.

As part of the data inventory, the entire production process was divided into production sections:

- Production of one ton of coke inside the factory Z10
- Production of one ton of pig iron inside the factory Z12
- Production of one ton of steel billets inside the factory Z13
- Production of one ton of flat rolled strips within plant Z16
- Production of one ton of reinforcing steel inside Z15 (Z15SV)

For individual production sections, according to input and output flows, the consumption of the number of inputs and the amount of produced outputs (waste, emissions) was allocated according to external sales of co-products (external sales of by-products or energy). Allocation was performed based on mass analysis. To calculate the consumption of sources, the share distribution of types of sources according to the data of OTE, a.s. for 2019.

2.7. Comparability

Environmental product declaration from different programs may not be comparable. Comparison or assessment of data reported in the EPD is only possible if all comparable data reported in accordance with EN 15804 + A1: 2013 have been determined according to the same rules.

2.8. Product variability

The resulting data are always given for **1 t** of the **average product**.

2.9. LCA: Results

Information on environmental impacts is expressed in the following tables. The individual results for the given impact categories are given in Table 2. Tables 3 to 5 provide additional environmental information. They are related to the declared unit (DJ) - **1t of the product**.

The impact assessment was carried out using characterization factors used in the European Life Cycle Reference Database (ELCD) provided by the European Commission - Directorate-General of the Joint Research Center - Institute for Environment and Sustainability.

2.9.1. Parameters describing environmental impacts

Table č.2: Parameters describing **environmental impacts**

Results LCA – Parameters describing **environmental impacts** (DJ = 1 t welded pipes)		
Parameter	**Unit**	**A1-A3**
Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb ekv.	1,07E-03
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ, výhřevnost	1,49E+04
Global warming potential (GWP)	kg CO2 ekv.	8,21E+02
Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 ekv.	6,14E-05
Formation potential of tropospheric ozone (POCP)	kg Ethene ekv.	5,51E-01
Acidification potential of soil and water (AP)	kg SO2 ekv.	5,59E+00
Eutrophication potential (EP)	kg (PO4)3- ekv.	2,74E+00

Table č. 3: Parameters describing **resource use**

Results LCA – Parameters describing **resource use** (DJ = 1 t welded pipes)		
Parameter	**Unit**	**A1-A3**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	1,68E+01
Use of renewable primary energy resources used as raw materials	MJ	0
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	1,68E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	5,37E+02
Use of non-renewable primary energy resources used as raw materials	MJ	2,65E+02
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ	8,02E+02
Use of secondary material	kg	4,40E+00
Use of renewable secondary fuels	MJ	0
Use of non-renewable secondary fuels	MJ	4,29E-01
Net use of fresh water	m^3	1,24E+00

Table č. 4: Other environmental information describing **waste categories**

Results LCA – Other environmental information describing **waste categories** (DJ = 1 t welded pipes)		
Parameter	**Unit**	**A1-A3**
Hazardous waste disposed	kg	7,13E-02
Non-hazardous waste disposed	kg	5,20E+00
Radioactive waste disposed	kg	0,00E+00

Table č. 5: Other environmental information describing **output flows**

Results LCA – Other environmental information describing **output flows** (DJ = 1 t welded pipes)		
Parameter	**Unit**	**A1-A3**
Components for re-use	kg	0,00E+00
Materials for recycling	kg	0,00E+00
Materials for energy recovery	kg	1,86E+00
Exported energy	MJ na energonositele	2,86E+01

2.9.2. LCA: Interpretation

The impact of production on the environment is mainly influenced by the partial process of iron production in blast furnaces and the production of steel, the results of which are transferred to

the subsequent process of pipe production. The influence of consumed electricity is also significant.

- **Global warming potential (GWP)** - the iron and steel production process has a decisive influence on its overall amount. In terms of individual input components, energy consumption (electricity) and transport in the iron production process.

- **Potential for stratospheric ozone depletion (ODP)** - the level of iron and steel production in particular contributes to the level of the indicator. From the point of view of individual input components, energy consumption (electricity, gas) and transport in the iron production process are important.

- **Eutrophication potential (EP)** - is most influenced by production in the steel plant and here especially by electricity consumption.

- **Ground-level ozone formation potential (POCP)** - the level of iron and steel production in particular contributes to the level of the indicator. From the point of view of individual input components, transport is important in the process of iron production. Electricity consumption is applied here to a lesser extent. Overall, the effect of multiple components accumulates here.

- **Potential acidification of soil and water (AP)** - the share of the iron and steel production process is significant. From the point of view of individual input components, especially transport in the process of iron production.

- **Potential loss of raw materials (ADP -elements and -fossil)** - the consumption of partial components (compressed gas, oxygen, ferroalloys, natural gas, electricity) also plays a more significant role here - all especially in the steelworks and blast furnace process.

3. LCA: scenarios and other technical information

Information modules A4 to C4 were not included in the LCA analysis.

4. LCA: Additional information

5. The EPD does not include additional documentation related to the declaration of supplementary Reference

ČSN ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations - Principles and procedures

EN 15804+A1:2013 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

ČSN EN ISO 14040:2006 (Environmental management - Life Cycle Assessment - Principles and Framework

ČSN EN ISO 14044:2006 Environmental management - Life Cycle Assessment – Requirements and guidelines

ČSN ISO 14063:2007 Environmental management - Environmental communication - Guidelines and examples

ČSN EN 15643-1:2011 Sustainability of construction works - Sustainability assessment of buildings - Part 1: General framework

ČSN EN 15643-2:2011 Sustainability of construction works - Assessment of buildings - Part 2: Framework for the assessment of environmental performance

ČSN EN 15942:2013 Sustainability of construction works - Environmental product declarations - Communication format business-to-business

TNI CEN/TR 15941:2012 Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data

ILCD handbook - JRC EU, 2011

Act No. 185/2001 Coll. as amended (Waste Act) - CZ

Decree No. 93/2016 Coll. Waste catalog - Waste catalog - CZ

Regulation No. 1907/2006 of the European Parliament on the Registration, Evaluation, Authorization and Restriction of Chemicals and establishing a European Chemicals Agency - REACH (Registration, Evaluation and Authorization of Chemicals)

Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labeling and packaging of substances and mixtures, amending and repealing Directives 67/548 / EEC and 1999/45 / EC and amending Regulation (EC) No 1907/2006 (CLP Regulation)

SimaPro LCA Package, Pré Consultants, the Netherlands , www.pre-sustainability.com

Ecoinvent Centre, www.Ecoinvent.org

Explanatory documents are available from the employee in the job position "Quality Management" of the organization Liberty Ostrava a.s.

6. Verification EPD

Independent verification of the declaration and data according to ČSN ISO 14025:2010			
CEN standard EN 15804+A1 serves as the core PCR			
☐	internal	☒	external
Third party verifier [b]:			
Elektrotechnický zkušební ústav, s.p. Pod Lisem 129 171 02 Praha 8 – Troja Česká republika ezú elektrotechnický zkušební ústav		Mgr. Miroslav Sedláček *Head of the Certification Body* **Miroslav Sedláček** Digitální podpis: 24.02.2022 09:23	
Elektrotechnický zkušební ústav, s.p., the Certification Body No. 3018 accredited by Czech Accreditation Institute, o.p.s. according to ČSN EN ISO/IEC 17065:2013			
[a] *Products category rules* [b] *Optional for business-to-business communication, mandatory for business-to-consumer communication (see ISO 14025:2006, 9.4).*			

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